II. Claim Amendments:

Listing of Claims:

Claims 1-253 (canceled)

254. (original) A rectification circuit comprising:
  a. a first rectifier element;
  b. a second rectifier element;
  c. an overlapping conduction rectifier control system to which said first and said second rectifier elements are responsive; and
  d. a DC output responsive to said first rectifier element and said second rectifier element.

255. (original) A rectification circuit as described in claim 254 wherein said overlapping conduction rectifier control system to which said first and said second rectifier elements are responsive causes conduction in both said first rectifier element and said second rectifier element to simultaneously occur at least some time.

256. (original) A rectification circuit as described in claim 254 wherein said first rectifier element comprises a first switched rectifier element and wherein said second rectifier element comprises a second switched rectifier element.

257. (original) A rectification circuit as described in claim 254 wherein said first rectifier element comprises a first controllable diode element and wherein said second rectifier element comprises a second controllable diode element.

258. (original) A rectification circuit as described in claim 254 wherein said overlapping conduction rectifier control system to which said first and said second rectifier elements are responsive comprises an overlapping conduction rectifier control system configured to create a conduction angle in each of said first and said second rectifier

elements selected from a group consisting of at least about 180 degrees, at least about 300 degrees, a conduction angle which creates a low rectifier RMS current, a conduction angle which creates a rectifier RMS current which is low as compared to an output current, a conduction angle which creates a rectifier RMS current which less than about 1.3 as compared to a DC output current, a conduction angle which creates a rectifier RMS current which less than about 1.4 as compared to a DC output current, a conduction angle which creates a rectifier RMS current which is less than about 1.5 as compared to a DC output current, and a conduction angle which creates zero voltage on each said rectifier at the time when said rectifier is switched to a conductive state.

259. (original) A rectification circuit as described in claim 254 or 258 wherein said rectification circuit further comprises high voltage response circuitry which subjects said first and said second rectifier elements to a high voltage when said first and said second rectifier elements are in a non-conducting state.

260. (original) A rectification circuit as described in claim 259 wherein said high voltage response circuitry subjects said first and said second rectifier elements to a voltage selected from a group consisting of at least about 1.4 times a DC output voltage, at least about 8 times a DC output voltage, at least about 15 volts, and at least about 20 volts.

261. (original) A rectification circuit as described in claim 254 and further comprising a transformer element to which said first and said second rectifier elements are responsive.

262. (original) A rectification circuit as described in claim 261 and further comprising a total capacitance and a transformer leakage inductance and wherein said overlapping conduction rectifier control system to which said first and said second rectifier elements are responsive comprises an overlapping conduction rectifier control system configured to create a conduction angle in each of said first and said second rectifier

elements, wherein said conduction angles and said total capacitance are coordinated with said transformer leakage inductance.

263. (original) A rectification circuit as described in claim 262 wherein said first rectifier element comprises a first switched rectifier element and wherein said second rectifier element comprises a second switched rectifier element such that said conduction angles and said total capacitance are coordinated with said transformer leakage inductance to create zero voltage on each said switched rectifier element at the time when each said rectifier is switched to a conductive state.

264. (original) A rectification circuit as described in claim 261 and further comprising a transformer leakage inductance, wherein said rectification circuit affirmatively utilizes said transformer leakage inductance as an energy storage element.

265. (original) A rectification circuit as described in claim 264 and further comprising a total capacitance and wherein said overlapping conduction rectifier control system to which said first and said second rectifier elements are responsive comprises an overlapping conduction rectifier control system configured to create a conduction angle in each of said first and said second rectifier elements, wherein said conduction angles and said total capacitance are coordinated with said transformer leakage inductance.

266. (original) A rectification circuit as described in claim 265 wherein said first rectifier element comprises a first switched rectifier element and wherein said second rectifier element comprises a second switched rectifier element such that said conduction angles and said total capacitance are coordinated with said transformer leakage inductance to create zero voltage on each said switched rectifier element at the time when each said rectifier is switched to a conductive state.

Claims 267-327 (cancelled)

328. (original) A rectification circuit comprising:

a. a first rectifier element;

b. a second rectifier element;

c. a passive sinusoidal drive system to which said first rectifier element and said second rectifier element are responsive; and

d. a DC output responsive to said first rectifier element and said second rectifier element.

329. (original) A rectification circuit as described in claim 328 and further comprising a synchronous rectifier control system to which said first and second rectifier elements are responsive.

330. (original) A rectification circuit as described in claim 328 wherein said passive sinusoidal drive system comprises a gate drive transformer element.

331. (original) A rectification circuit as described in claim 328 wherein said sinusoidal drive system to which said first and second rectifier elements are responsive comprises a high frequency sinusoidal drive system.

332. (original) A rectification circuit as described in claim 331 wherein said high frequency sinusoidal drive system comprises a drive system operating at a frequency selected from a group consisting of a frequency greater than at least about 300 kHz, a frequency greater than at least about 500 kHz, a frequency greater than at least about 1 MHZ, a frequency greater than at least about 3 MHZ, a frequency greater than at least about 10 MHZ, a frequency greater than at least about 30 MHZ, a frequency coordinated with an inherent capacitance of said first and second synchronous rectifier elements, and any permutations or combinations of the above.

333. (original) A rectification circuit as described in claim 329 wherein said synchronous rectifier control system comprises a bias input.

334. (original) A rectification circuit as described in claim 333 wherein said bias input comprises a DC input.

335. (original) A rectification circuit as described in claim 333 wherein said bias input comprises a low frequency input.

336. (original) A rectification circuit as described in claim 334 wherein each of said first and second synchronous rectifier elements comprise a conduction angle responsive to said DC input.

337. (original) A rectification circuit as described in claim 335 wherein each of said first and second synchronous rectifier elements comprise a conduction angle responsive to said low frequency input.

Claims 338-357 (cancelled)

358. (previously presented) A method of current rectification, comprising the steps of:

a. providing a first rectifier element and a second rectifier element;

b. providing an AC input to said first and second rectifier elements;

c. controlling overlapping conduction of said first and said second rectifier elements; and

d. producing a DC output.

359. (currently amended) A method of current rectification, comprising the steps of:

a. providing a first ~~rectifier~~ synchronous rectifier element and a second synchronous rectifier element;

b. providing an AC input to said first and second synchronous rectifier elements;

c. passively sinusoidally driving said first and said second synchronous rectifier elements; and

d. producing a DC output.

360. (previously presented) An AC to DC conversion system comprising:

a. an AC input;

b. a rectification circuit having a total capacitance; and

c. a DC output;

wherein said conversion system affirmatively utilizes said total capacitance of said rectification circuit.

361. (previously presented) An AC to DC conversion system as described in claim 360 wherein said rectification circuit comprises at least two rectifier elements.

362. (previously presented) An AC to DC conversion system as described in claim 361 wherein said at least two rectifier elements each comprise a Field Effect Transistor.

363. (previously presented) An AC to DC conversion system as described in claim 362 wherein said total capacitance of said rectification circuit comprises an adjunct drain-to-source capacitance of each Field Effect Transistor.

364. (previously presented) An AC to DC conversion system as described in claim 363 wherein said total capacitance of said rectification circuit further comprises circuit capacitance additional to said adjunct drain to source capacitance of each Field Effect Transistor.

365. (previously presented) An AC to DC conversion system as described in claim 361 wherein said at least two rectifier elements each comprise a synchronous rectifier element.

366. (previously presented) An AC to DC conversion system as described in claim 365 wherein said total capacitance of said rectification circuit comprises an adjunct capacitance of each synchronous rectifier element.

367. (previously presented) An AC to DC conversion system as described in claim 366 wherein said total capacitance of said rectification circuit further comprises circuit capacitance additional to said adjunct capacitance of each synchronous rectifier element.

368. (previously presented) An AC to DC conversion system as described in claim 366 wherein said conversion system affirmatively utilizes said adjunct capacitance of each said synchronous rectifier element to create zero voltage on each said synchronous rectifier element prior to a switched conductive state of each said synchronous rectifier element.

369. (previously presented) An AC to DC conversion system as described in claim 365 wherein said conversion system operates at a power conversion frequency and wherein said conversion system affirmatively utilizes said power conversion frequency to create zero voltage on each said synchronous rectifier element prior to a switched conductive state of each said synchronous rectifier element.

370. (previously presented) An AC to DC conversion system as described in claim 369 wherein said conversion system operates at a frequency selected from a group consisting of a frequency greater than at least about 300 kHz, a frequency greater than at least about 500 kHz, a frequency greater than at least about 1 MHZ, a frequency greater than at least about 3 MHZ, a frequency greater than at least about 10 MHZ, a frequency greater than at least about 30 MHZ.

371. (previously presented) An AC to DC conversion system as described in claim 365 and further comprising an overlapping conduction rectifier control system and wherein said conversion system affirmatively utilizes a conduction angle of each said synchronous rectifier element to create zero voltage on each said synchronous rectifier element prior to a switched conductive state of each said synchronous rectifier element.

372. (previously presented) An AC to DC conversion system as described in claim 371 wherein said conduction angle of each of said at least two rectifier elements is selected from a group consisting of at least about 180 degrees, at least about 300 degrees, a conduction angle which creates a low rectifier RMS current, a conduction angle which creates a rectifier RMS current which is low as compared to an output current, a conduction angle which creates a rectifier RMS current which less than about 1.3 as compared to a DC output current, a conduction angle which creates a rectifier RMS current which less than about 1.4 as compared to a DC output current, and a conduction angle which creates a rectifier RMS current which is less than about 1.5 as compared to a DC output current.

373. (previously presented) An AC to DC conversion system as described in claim 365 and further comprising a transformer element and wherein said conversion system affirmatively utilizes a transformer leakage inductance of said transformer element to create zero voltage on each said synchronous rectifier element prior to a switched conductive state of each said synchronous rectifier element.

374. (previously presented) An AC to DC conversion system as described in claim 365 wherein said conversion system affirmatively coordinates a power conversion frequency of said conversion system, a conduction angle of each said synchronous rectifier element, a transformer leakage inductance of said conversion system, and said total capacitance to create zero voltage on each said synchronous rectifier element prior to a switched conductive state of each said synchronous rectifier element.

375. (previously presented) An AC to DC conversion system as described in claim 360 wherein said DC output powers a low voltage, high current component operating at a nominal DC voltage selected from a group consisting of less than about 2 volts, less than about 1.8 volts, less than about 1.5 volts, less than about 1.3 volts, less than about 1 volt, and less than about 0.4 volts.

376. (previously presented) An AC to DC conversion system as described in claim 360 wherein said DC output powers a low voltage, high current component capable of a rapid current demand which rises at a level selected from a group consisting of at least about 0.2 amperes per nanosecond, at least about 0.5 amperes per nanosecond, at least about 1 ampere per nanosecond, at least about 3 amperes per nanosecond, at least about 10 amperes per nanosecond, and at least about 30 amperes per nanosecond.

377. (previously presented) An AC to DC conversion system as described in claim 360 wherein said DC output powers a low voltage, high current component operating at a maximum current selected from a group consisting of more than about 15 amperes, more than about 20 amperes, more than about 50 amperes, and more than about 100 amperes.

378. (previously presented) A method of AC to DC conversion, comprising the steps of:
   a. providing a rectification circuit having a total capacitance;
   b. providing an AC input to said rectification circuit;
   c. affirmatively utilizing said total capacitance of said rectification circuit; and
   d. producing a DC output.

379. (new) A method of AC to DC conversion as described in claim 378 wherein said step of providing a rectification circuit having a total capacitance comprises the step of providing at least two rectifier elements.

380. (new) A method of AC to DC conversion as described in claim 379 wherein said step of providing at least two rectifier elements comprises the step of providing at least two Field Effect Transistors.

381. (new) A method of AC to DC conversion as described in claim 380 wherein said step of providing a rectification circuit having a total capacitance comprises the step of providing a rectification circuit having a total capacitance that comprises an adjunct drain-to-source capacitance of each Field Effect Transistor.

382. (new) A method of AC to DC conversion as described in claim 381 wherein said step of providing a rectification circuit having a total capacitance that comprises an adjunct drain-to-source capacitance of each Field Effect Transistor comprises the step of providing a rectification circuit having a total capacitance that further comprises circuit capacitance additional to said adjunct drain to source capacitance of each Field Effect Transistor.

383. (new) A method of AC to DC conversion as described in claim 379 wherein said step of providing at least two rectifier elements comprises the step of providing at least two synchronous rectifier elements.

384. (new) A method of AC to DC conversion as described in claim 383 wherein said step of providing a rectification circuit having a total capacitance comprises the step of providing a rectification circuit having a total capacitance that comprises an adjunct capacitance of each synchronous rectifier element.

385. (new) A method of AC to DC conversion as described in claim 384 wherein said step of providing a rectification circuit having a total capacitance that comprises an adjunct capacitance of each synchronous rectifier element comprises the step of providing a rectification circuit having a total capacitance that further comprises circuit capacitance additional to said adjunct capacitance of each synchronous rectifier element.

386. (new) A method of AC to DC conversion as described in claim 384 wherein said step of affirmatively utilizing said total capacitance of said rectification circuit comprises the step of affirmatively utilizing said adjunct capacitance of each said synchronous rectifier element to create zero voltage on each said synchronous rectifier element prior to a switched conductive state of each said synchronous rectifier element.

387. (new) A method of AC to DC conversion as described in claim 383 further comprising the step of operating at a power conversion frequency and wherein said step of affirmatively utilizing said total capacitance of said rectification circuit comprises the step of affirmatively utilizing said power conversion frequency to create zero voltage on each said synchronous rectifier element prior to a switched conductive state of each said synchronous rectifier element.

388. (new) A method of AC to DC conversion as described in claim 387 further comprising the step of operating at a frequency selected from a group consisting of a frequency greater than at least about 300 kHz, a frequency greater than at least about 500 kHz, a frequency greater than at least about 1 MHZ, a frequency greater than at least about 3 MHZ, a frequency greater than at least about 10 MHZ, a frequency greater than at least about 30 MHZ.

389. (new) A method of AC to DC conversion as described in claim 383 further comprising the steps of establishing overlapping conduction of said first and said second rectifier elements, and creating zero voltage on each said synchronous rectifier element prior to a switched conductive state of each said synchronous rectifier element.

390. (new) A method of AC to DC conversion as described in claim 389 wherein said step of affirmatively utilizing a conduction angle of each said synchronous rectifier element to create zero voltage on each said synchronous rectifier element comprises the step of affirmatively utilizing a conduction angle of each of said at least two rectifier elements that is selected from a group consisting of at least about 180 degrees, at least about 300 degrees, a conduction angle which creates a low rectifier RMS current, a conduction angle which creates a rectifier RMS current which is low as compared to an output current, a conduction angle which creates a rectifier RMS current which less than about 1.3 as compared to a DC output current, a conduction angle which creates a rectifier RMS current which less than about 1.4 as compared to

a DC output current, and a conduction angle which creates a rectifier RMS current which is less than about 1.5 as compared to a DC output current.

391. (new) A method of AC to DC conversion as described in claim 383 further comprising the step of affirmatively utilizing a transformer leakage inductance to create zero voltage on each said synchronous rectifier element prior to a switched conductive state of each said synchronous rectifier element.

392. (new) A method of AC to DC conversion as described in claim 383 further comprising the step of affirmatively coordinating a power conversion frequency at which said method of AC to DC conversion operates, a conduction angle of each said synchronous rectifier element, a transformer leakage inductance of said conversion system, and said total capacitance to create zero voltage on each said synchronous rectifier element prior to a switched conductive state of each said synchronous rectifier element.

393. (new) A method of AC to DC conversion as described in claim 378 further comprising the step of powering with said DC output a low voltage, high current component operating at a nominal DC voltage selected from a group consisting of less than about 2 volts, less than about 1.8 volts, less than about 1.5 volts, less than about 1.3 volts, less than about 1 volt, and less than about 0.4 volts.

394. (new) A method of AC to DC conversion as described in claim 378 further comprising the step of powering with said DC output a low voltage, high current component capable of a rapid current demand which rises at a level selected from a group consisting of at least about 0.2 amperes per nanosecond, at least about 0.5 amperes per nanosecond, at least about 1 ampere per nanosecond, at least about 3 amperes per nanosecond, at least about 10 amperes per nanosecond, and at least about 30 amperes per nanosecond.

395. (new) A method of AC to DC conversion as described in claim 378 further comprising the step of powering with said DC output a low voltage, high current component operating at a maximum current selected from a group consisting of more than about 15 amperes, more than about 20 amperes, more than about 50 amperes, and more than about 100 amperes.

396. (new) A method of current rectification as described in claim 358 wherein said step of controlling overlapping conduction of said first and said second rectifier elements comprises the step of causing conduction in both said first rectifier element and said second rectifier element to simultaneously occur at least some time.

397. (new) A method of current rectification as described in claim 358 wherein said step of providing a first rectifier element and a second rectifier element comprises the step of providing a first switched rectifier element and a second switched rectifier element.

398. (new) A method of current rectification as described in claim 358 wherein said step of providing a first rectifier element and a second rectifier element comprises the step of providing a first controllable diode element and a second controllable diode element.

399. (new) A method of current rectification as described in claim 358 further comprising the step of creating a conduction angle in each of said first and said second rectifier elements selected from a group consisting of at least about 180 degrees, at least about 300 degrees, a conduction angle which creates a low rectifier RMS current, a conduction angle which creates a rectifier RMS current which is low as compared to an output current, a conduction angle which creates a rectifier RMS current which less than about 1.3 as compared to a DC output current, a conduction angle which creates a rectifier RMS current which less than about 1.4 as compared to a DC output current, a conduction angle which creates a rectifier RMS current which is less than about 1.5 as compared to a DC output current, and a conduction angle which creates zero voltage on each said rectifier at the time when said rectifier is switched to a conductive state.

400. (new) A method of current rectification as described in claim 358 or 399 further comprising the step of subjecting said first and said second rectifier elements to a high voltage when said first and said second rectifier elements are in a non-conducting state.

401. (new) A method of current rectification as described in claim 400 further comprising the step of subjecting said first and said second rectifier elements to a voltage selected from a group consisting of at least about 1.4 times a DC output voltage, at least about 8 times a DC output voltage, at least about 15 volts, and at least about 20 volts.

402. (new) A method of current rectification as described in claim 358 further comprising the step of utilizing a transformer.

403. (new) A method of current rectification as described in claim 402 further comprising the steps of creating a conduction angle in each of said first and said second rectifier elements, and coordinating said conduction angles and a total capacitance of said rectifier elements with a transformer leakage inductance.

404. (new) A method of current rectification as described in claim 403 wherein said step of providing a first rectifier element and a second rectifier element comprises the step of providing a first switched rectifier element and a second switched rectifier element, and further comprising the step of coordinating said conduction angles and said total capacitance with said transformer leakage inductance to create zero voltage on each said switched rectifier element at the time when each said rectifier is switched to a conductive state.

405. (new) A method of current rectification as described in claim 402 further comprising the step of affirmatively utilizing a transformer leakage inductance as energy storage.

406. (new) A method of current rectification as described in claim 405 further comprising the steps of creating a conduction angle in each of said first and said second rectifier elements and coordinating said conduction angles and a total capacitance of said rectifier elements with said transformer leakage inductance.

407. (new) A method of current rectification as described in claim 406 wherein said step of providing a first rectifier element and a second rectifier element comprises the step of providing a first switched rectifier element and a second switched rectifier, and further comprising the step of coordinating said conduction angles and a total capacitance of said rectifier elements are coordinated with said transformer leakage inductance to create zero voltage on each said switched rectifier element at the time when each said rectifier is switched to a conductive state.

408. (new) A method of current rectification as described in claim 359 further comprising the step of providing a synchronous rectifier control system to which said first and second synchronous rectifier elements are responsive.

409. (new) A method of current rectification as described in claim 359 wherein said step of passively sinusoidally driving said first and said second synchronous rectifier elements comprises the step of driving said first and said second synchronous rectifier elements with a gate drive transformer element.

410. (new) A method of current rectification as described in claim 359 wherein said step of passively sinusoidally driving said first and said second synchronous rectifier elements comprises the step of driving said first and said second synchronous rectifier elements through use of a high frequency sinusoidal drive system.

411. (new) A method of current rectification as described in claim 410 wherein said step of passively sinusoidally driving said first and said second synchronous rectifier elements comprises the step of driving said first and said second synchronous rectifier elements at a frequency selected from a group consisting of a frequency greater than at least

about 300 kHz, a frequency greater than at least about 500 kHz, a frequency greater than at least about 1 MHZ, a frequency greater than at least about 3 MHZ, a frequency greater than at least about 10 MHZ, a frequency greater than at least about 30 MHZ, a frequency coordinated with an inherent capacitance of said first and second synchronous rectifier elements, and any permutations or combinations of the above.

412. (new) A method of current rectification as described in claim 408 wherein said step of providing a synchronous rectifier control system to which said first and second synchronous rectifier elements are responsive comprises the step of providing a bias input.

413. (new) A method of current rectification as described in claim 412 wherein said step of providing a bias input comprises the step of providing a DC input.

414. (new) A method of current rectification as described in claim 412 wherein said step of biasing an input comprises the step of biasing a low frequency input.

415. (new) A method of current rectification as described in claim 413 further comprising the step of establishing a conduction angle responsive to said DC input.

416. (new) A method of current rectification as described in claim 414 wherein said step of providing a first synchronous rectifier element and a second synchronous rectifier element comprises the step of providing a first synchronous rectifier element and a second synchronous rectifier element that comprise a conduction angle responsive to said low frequency input.